

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A transmitter comprising:

~~an amplitude calculating means for calculating unit which calculates~~ an amplitude of an input modulating signal;

~~a distortion compensation data storage means for storing unit which stores~~ distortion data on a normal characteristic or a reverse characteristic to carry out a distortion compensation for the input modulating signal;

~~a distortion compensating means for reading unit which reads~~ the distortion data on the normal characteristic or the reverse characteristic from the distortion compensation data storage means unit based on an output of the amplitude calculating means unit and multiplying multiplies or dividing divides the input modulating signal and the distortion data to carry out the distortion compensation;

~~a quadrature modulating means for carrying unit which carries~~ out a quadrature modulation in response to an output of the distortion compensating means unit;

~~a variable gain amplifying means for amplifying unit which amplifies~~ an output of the quadrature modulating means unit to control a gain based on a gain control signal;

~~a power amplifying means serving unit which serves~~ to carry out a power amplification for an output of the variable gain amplifying means unit and ~~having~~ has a linear mode for carrying out the power amplification by using a linear operating region in an input/output power characteristic and a saturation mode for carrying out the power amplification by using a saturation operating region in the input/output power characteristic; and

~~an amplitude modulating means for inputting unit which inputs~~ an amplitude component of the output of the distortion compensating means unit to an output controlling input terminal of the power amplifying means unit, thereby ~~carrying~~ carries out a polar coordinate modulation,

wherein the input modulating signal and the distortion data on the normal characteristic are multiplied or the input modulating signal and the distortion data on the reverse characteristic are divided in the distortion compensating means unit in the case in which the power amplifying means unit is operated in the saturation mode to carry out the polar coordinate modulation, and the input modulating signal and the distortion data on the normal characteristic are divided or the input modulating signal and the distortion data on the reverse characteristic are multiplied in the distortion compensating means unit in the case in which the power amplifying means unit is operated in the linear mode to carry out a linear amplification.

Claims 2-6 (canceled)

Claim 7 (currently amended): The transmitter according to ~~any of claims 1 to 6~~ claim 1, wherein the power amplifying ~~means~~ unit carries out the polar coordinate modulation when a transmitting output power is on a maximum output level or in the vicinity thereof, and carries out the linear amplification when the transmitting output power is lower than the transmitting power.

Claim 8 (currently amended): The transmitter according to ~~any of claims 1 to 7~~ claim 1,

wherein the power amplifying ~~means~~ unit comprises a power terminal to be used as the output controlling input terminal; and

wherein the transmitter further comprises a power driver which serves to increase a current capacity of the signal on the predetermined level or a signal subjected to an amplitude modulation based on the amplitude component of the input modulating signal and to supply a power as a transmitting output control signal to the power terminal.

Claim 9 (canceled)

Claim 10 (new): A transmitter comprising:

an amplitude calculating unit which calculates an amplitude of an input modulating signal;

a normal and reverse distortion compensation data storage unit which stores distortion data on a normal characteristic and a reverse characteristic to carry out a distortion compensation for the input modulating signal;

a distortion compensating unit which reads the distortion data on the normal characteristic or the reverse characteristic from the normal and reverse distortion compensation data storage unit based on an output of the amplitude calculating unit and multiplies the input modulating signal and the distortion data to carry out the distortion compensation;

a quadrature modulating unit which carries out a quadrature modulation in response to an output of the distortion compensating unit;

a variable gain amplifying unit which amplifies an output of the quadrature modulating unit to control a gain based on a gain control signal;

a power amplifying unit which serves to carry out a power amplification for an output of the variable gain amplifying unit and has a linear mode for carrying out the power amplification by using a linear operating region in an input/output power characteristic and a saturation mode for carrying out the power amplification by using a saturation operating region in the input/output power characteristic; and

an amplitude modulating unit which inputs an amplitude component of the output of the distortion compensating unit to an output controlling input terminal of the power amplifying unit, thereby carries out a polar coordinate modulation,

wherein the input modulating signal and the distortion data on the normal characteristic are multiplied in the distortion compensating unit in the case in which the power amplifying unit is operated in the saturation mode to carry out the polar coordinate modulation, and the input modulating signal and the distortion data on the reverse characteristic are multiplied in the distortion

compensating unit in the case in which the power amplifying unit is operated in the linear mode to carry out a linear amplification.

Claim 11 (new): The transmitter according to claim 10, wherein the power amplifying unit carries out the polar coordinate modulation when a transmitting output power is on a maximum output level or in the vicinity thereof, and carries out the linear amplification when the transmitting output power is lower than the transmitting power.

Claim 12 (new): The transmitter according to claim 10,
wherein the power amplifying unit comprises a power terminal to be used as the output controlling input terminal; and

wherein the transmitter further comprises a power driver which serves to increase a current capacity of the signal on the predetermined level or a signal subjected to an amplitude modulation based on the amplitude component of the input modulating signal and to supply a power as a transmitting output control signal to the power terminal.

Claim 13 (new): A transmitter comprising:
a quadrature modulating unit which inputs an in-phase component and a quadrature component of an input modulating signal, thereby carries out a quadrature modulation;

a variable gain amplifying unit which amplifies an output of the quadrature modulating unit to control a gain based on a gain control signal;

a power amplifying unit which serves to carry out a power amplification for an output of the variable gain amplifying unit and has a linear mode for carrying out the power amplification by using a linear operating region in an input/output power characteristic and a saturation mode for carrying out the power amplification by using a saturation operating region in the input/output power characteristic;

an amplitude calculating unit which calculates an amplitude of the input modulating signal;

an amplitude modulating unit which inputs an amplitude component of the input modulating signal to an output controlling input terminal of the power amplifying unit, thereby carries out a polar coordinate modulation;

an amplitude distortion data storage unit which stores distortion data for the amplitude of the input modulating signal; and

a distortion adding unit which reads the distortion data from the amplitude distortion data storage unit based on an output of the amplitude calculating unit and multiplies the amplitude of the input modulating signal and the distortion data in the case in which the power amplifying unit is operated in the saturation mode to carry out the polar coordinate modulation.

Claim 14 (new): The transmitter according to claim 13, wherein the power amplifying unit carries out the polar coordinate modulation when a transmitting output power is on a maximum output level or in the vicinity thereof, and carries

out the linear amplification when the transmitting output power is lower than the transmitting power.

Claim 15 (new): The transmitter according to claim 13,

wherein the power amplifying unit comprises a power terminal to be used as the output controlling input terminal; and

wherein the transmitter further comprises a power driver which serves to increase a current capacity of the signal on the predetermined level or a signal subjected to an amplitude modulation based on the amplitude component of the input modulating signal and to supply a power as a transmitting output control signal to the power terminal.

Claim 16 (new): A transmitter comprising:

a quadrature modulating unit which inputs an in-phase component and a quadrature component of an input modulating signal, thereby carries out a quadrature modulation;

a first variable gain amplifying unit which a distortion control which serves to amplify an output of the quadrature modulating unit, thereby controls a gain based on a distortion control signal;

a second variable gain amplifying unit for a gain control which serves to amplify an output of the first variable gain amplifying unit, thereby controls a gain based on a gain control signal;

a power amplifying unit which serves to carry out a power amplification for an output of the second variable gain amplifying unit and has a linear mode for

carrying out the power amplification by using a linear operating region in an input/output power characteristic and a saturation mode for carrying out the power amplification by using a saturation operating region in the input/output power characteristic;

an amplitude detecting unit which detects an amplitude of the output of the first variable gain amplifying unit; and

an amplitude modulating unit which inputs an output of the amplitude detecting unit to an output controlling input terminal of the power amplifying unit, thereby carries out a polar coordinate modulation.

Claim 17 (new): The transmitter according to claim 16, wherein the power amplifying unit carries out the polar coordinate modulation when a transmitting output power is on a maximum output level or in the vicinity thereof, and carries out the linear amplification when the transmitting output power is lower than the transmitting power.

Claim 18 (new): The transmitter according to claim 16, wherein the power amplifying unit comprises a power terminal to be used as the output controlling input terminal; and

wherein the transmitter further comprises a power driver which serves to increase a current capacity of the signal on the predetermined level or a signal subjected to an amplitude modulation based on the amplitude component of the input modulating signal and to supply a power as a transmitting output control signal to the power terminal.

Claim 19 (new): A transmitter comprising:

a polar coordinate transforming portion for transforming an input modulating signal constituted by an in-phase component and a quadrature component into an amplitude signal and a phase signal;

a distortion data storage unit which stores distortion data to add a distortion to the amplitude signal and the phase signal;

a distortion adding unit which reads the distortion data from the distortion data storage unit based on the amplitude signal and adds a distortion to the amplitude signal and the phase signal;

a distortion compensation data storage unit which stores two types of distortion data to carry out a distortion compensation for amplitude signal and phase signal outputs of the distortion adding unit;

a distortion compensating unit which selects and reads any of the distortion data from the distortion compensation data storage unit based on the amplitude signal output of the distortion adding unit and carries out a distortion compensation for the amplitude signal and phase signal outputs of the distortion adding unit;

a rectangular coordinate transforming unit which transforms any of an amplitude signal output of the distortion compensating unit, a fixed value output and the amplitude signal output of the distortion adding unit and a phase signal output of the distortion compensating unit into an in-phase component and a quadrature component;

a quadrature modulating unit which carries out a quadrature modulation in response to an output of the rectangular coordinate transforming unit;

a variable gain amplifying unit which amplifies an output of the quadrature modulating unit to control a gain based on a gain control signal;

a power amplifying unit which serves to carry out a power amplification for an output of the variable gain amplifying unit and has a linear mode for carrying out the power amplification by using a linear operating region in an input/output power characteristic and a saturation mode for carrying out the power amplification by using a saturation operating region in the input/output power characteristic; and

an amplitude modulating unit which inputs an amplitude component of the output of the distortion compensating unit to an output controlling input terminal of the power amplifying unit, thereby carries out a polar coordinate modulation,

wherein an amplitude signal input to the rectangular coordinate transforming unit is set to be the fixed value or the amplitude output in the distortion adding unit in the case in which the power amplifying unit is operated in the saturation mode to carry out the polar coordinate modulation, and is set to be the amplitude output in the distortion compensating unit in the case in which the power amplifying unit is operated in the linear mode to carry out a linear amplification.

Claim 20 (new): The transmitter according to claim 19, wherein when the power amplifying unit is to be operated in the saturation mode to carry out the polar coordinate modulation, the amplitude signal input to the rectangular

coordinate transforming unit is set to be a fixed value if an operating mode is a cellular system communication and is set to be an amplitude output in the distortion adding unit in case of a WLAN system communication.

Claim 21 (new): The transmitter according to claim 19, wherein the power amplifying unit carries out the polar coordinate modulation when a transmitting output power is on a maximum output level or in the vicinity thereof, and carries out the linear amplification when the transmitting output power is lower than the transmitting power.

Claim 22 (new): The transmitter according to claim 19,
wherein the power amplifying unit comprises a power terminal to be used as the output controlling input terminal; and

wherein the transmitter further comprises a power driver which serves to increase a current capacity of the signal on the predetermined level or a signal subjected to an amplitude modulation based on the amplitude component of the input modulating signal and to supply a power as a transmitting output control signal to the power terminal.

Claim 23 (new): A radio communicating device comprising the transmitter according to claim 19.